

# Distribution and population size of Chapin's Flycatcher *Muscicapa lendu* in Kakamega Forest, Kenya

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Distribution et taille de la population du Gobemouche de Chapin *Muscicapa lendu* dans la forêt de Kakamega, Kenya. Le Gobemouche de Chapin *Muscicapa lendu*, classé comme Vulnérable par BirdLife International (2000, 2004), est parmi les espèces les plus menacées au Kenya, vu le peu de forêt ombrophile encore présente. De novembre 2002 à février 2003, nous avons étudié sa distribution et la taille de sa population dans la forêt de Kakamega, Kenya. L'espèce a été recherchée le long de 125 transects de 500 × 40 m dans cinq lambeaux de forêt. Dix-sept oiseaux (13 individus solitaires et deux couples) ont été vus dans trois fragments: Isecheno, Ikuywa et Buyangu. Nous n'en n'avons pas trouvé dans la Réserve Naturelle de Yala ni dans la Réserve Nationale de Kisere. La densité de la population a été estimée à environ un individu pour 20 ha, et la population entière à environ 200 individus. Les gobemouches ont été observés à des hauteurs de 12–22 m, principalement sur des branches sans feuilles, dans une zone de grands arbres (hauteur moyenne 27 m), avec une couverture de voûte de 32%. La diminution et la fragmentation du milieu forestier sont sans doute responsables du petit nombre d'oiseaux recensés. Le degré d'isolement des fragments forestiers pourrait conduire à des accidents génétiques ou démographiques. Nous suggérons que les fragments actuels doivent être mieux protégés et qu'il serait très utile de planter des corridors pour connecter ces fragments, avec bien sûr des essences indigènes. Il est recommandé de continuer à étudier l'écologie de l'espèce afin de prendre les mesures de conservation appropriées.

**Summary.** Among the most threatened species of Kenya's remaining rainforest is Chapin's Flycatcher *Muscicapa lendu*, a species currently listed as Vulnerable by BirdLife International (2000, 2004). Between November 2002 and February 2003, we studied its distribution and population status in Kakamega Forest, Kenya. The species was searched for along 125 transects of 500 × 40 m in five forest fragments. Seventeen birds (13 singles and two pairs) were sighted in three fragments, Isecheno, Ikuywa and Buyangu, but we failed to find it in Yala Nature Reserve and Kisere National Reserve. Population density was estimated at c. 1 bird per 20 ha, and the overall population estimated at c. 200 birds. Flycatchers were recorded perching at 12–22 m, mostly on bare branches of tall indigenous trees with mean canopy height of 27 m and mean canopy cover of 32%. Habitat loss, particularly through forest fragmentation, is possibly the main cause of the small population size. That forest fragments are distant from each other could make the species vulnerable to genetic or demographic disasters. We recommend improved forest management practises to ensure retention of tall indigenous trees, and connecting forest patches via corridors of planted indigenous trees. Further studies are required in order to understand this species' ecology and formulate appropriate conservation measures.

Chapin's Flycatcher *Muscicapa lendu* is a scarce and globally threatened (Vulnerable), range-restricted species (BirdLife International 2000, 2004), known only from the Itombwe Mountains and Lendu Plateau in eastern Democratic Republic of Congo, Bwindi Impenetrable National Park in Uganda, and Kakamega and North Nandi Forests in western Kenya, with an unconfirmed sight record from Nyungwe Forest, Rwanda (BirdLife International 2000, 2004).

Kakamega Forest is an Important Bird Area (IBA) of 18,300 ha and the only true tropical lowland rainforest in Kenya, which was formerly part of a contiguous forest ecosystem that included the Nandi-Tinderet block and stretched as far as West Africa (Blackett 1994).

Chapin's Flycatcher appears to be rare throughout its range and intensive pressure on its habitat implies that its small population is probably declining (BirdLife International 2000, 2004).

Little is known concerning the current status of the species, and no adequate ecological data on which to base effective conservation measures are available.

Between November 2002 and February 2003, we undertook a study of Chapin's Flycatcher in Kakamega Forest to (1) determine its distribution within the forest fragments, (2) estimate its population density, and (3) investigate its preferred vegetation characteristics. Such data should serve as a base for future ecological studies and conservation programmes.

## Study area

Kakamega Forest (00°10'–00°21'N 34°47'–34°58'E) lies at 1,500–1,700 m altitude. Mean annual rainfall is 2,000 mm and temperature 10.6–27.7°C (Blackett 1994; for a detailed description see Kokwaro 1988).

The human population in the forest's environs is rapidly increasing and its activities have fragmented the once-contiguous forest into several patches that are decreasing in extent. These forest fragments include Isecheno (310 ha) and Yala nature reserves (1,000 ha), Ikuywa River Forest (1,450 ha), Kakamega National Reserve (4,457 ha, comprising Buyangu and Kisere fragments), Malava East (75 ha) and Malava West (25 ha) (Fig. 1). The IBA, although suffering from ongoing degradation, fragmentation and destruction, still provides suitable habitat for Chapin's Flycatcher, the equally globally threatened Turner's Eremomela *Eremomela turneri* and 194 forest-dependent bird species (BirdLife International 2000). Hartlaub's Turaco *Tauraco hartlaubi* and Fine-banded Woodpecker *Campethera tullbergi* have disappeared since the forest became disconnected from North Nandi Forest IBA, and Yellow-mantled Weaver *Ploceus tricolor* has not been recorded for many years (Bennun & Njoroge 2001).

Our study concentrated on the forested areas of Isecheno, Ikuywa (including Lirhanda Hill), Yala Nature Reserve and Kakamega National Reserve (Buyangu and Kisere). Surveys were not conducted in Malava East and Malava West due to logistical difficulties and because they mainly consist of exotic tree plantations.

## Methods

In November 2002, we conducted a three-week reconnaissance visit to all five study sites. The visit was used mainly to familiarise ourselves with Chapin's Flycatcher's identification features, vocalisations, behaviour and general habitat choice. Local bird guides were interviewed and searches for the birds were conducted. We also tested the effectiveness of playback of Red-chested Owlet *Glaucidium tephronotum* calls for attracting our study species.

The main field work was undertaken from 17 January to 25 February 2003 (40 days) in Isecheno, Ikuywa, and Buyangu forest fragments, where Chapin's Flycatcher were sighted during the reconnaissance. Birds were searched for along existing trails, which were used as transect routes. In total, 125 transects of 500 m length and 40 m width were sampled during mornings (07.00–11.00 hrs) and evenings (16.00–17.00 hrs) by three observers using binoculars at a speed of c.300 m/h. Red-chested Owlet calls were played

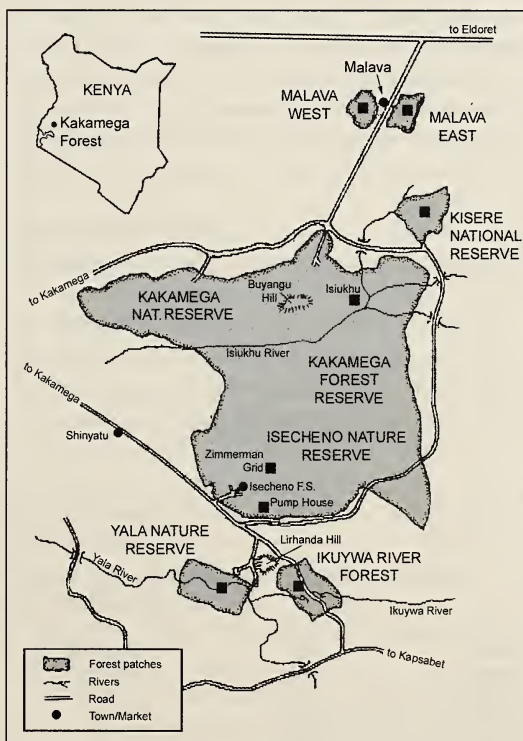


Figure 1. Map of the study area.

Carte de la zone d'étude.

for two minutes at the start and end of each transect.

Only positively identified Chapin's Flycatchers were noted and their perch height estimated. Perch position was recorded as: bare branch, inside canopy or edge of canopy. Behaviour was recorded as flying or perching quietly. Canopy height and percentage of canopy cover within a 20-m radius were noted. Similar habitat data from random points in the same study fragments are available (Gibbon 1991, Oyugi 1998, Brooks *et al.* 1999) and we tested for differences in habitat structure between the random points and those where Chapin's Flycatcher was detected. The population density of flycatchers in each fragment was estimated by dividing the number of birds seen by the total area sampled by the transects.

Results

Chapin's Flycatcher was recorded in three of the five surveyed forest fragments (Table 1, Fig. 1). In Isecheno birds were sighted within the 'Zimmerman grid' and surrounding forest, including the Pump House trail; and in Ikuywa, at Ikuywa River bridge and upstream. One bird was recorded in forest around Lirhandu Hill during the reconnaissance but not subsequently. In Buyangu, the species was found along the Isiukhu River and in a forest patch behind the viewpoint at Buyangu Hill. In total, 17 individuals, comprising 13 singles and two pairs, were recorded. We estimated population density at 0.05 birds/ha (one bird per 20 ha).

Chapin's Flycatcher appears to prefer tall indigenous tree species. Eleven of the 15 sightings were made in the mid and upper canopy of primary forest, especially in tall indigenous trees such

as *Antiaris toxicaria*, *Celtis africana*, *Albizia gum-mifera*, *Olea capensis*, *Cordia abyssinica* and *Fagara* spp. The remaining four encounters were in secondary forest dominated by *Maesopsis eminii* trees. Chapin's Flycatchers did not react to playback of Red-crested Owlet calls.

Birds were more often (*n*=13) observed perching quietly on bare branches within the canopy than on foliage or at canopy edges. Perch height was 12–22 m (mean 17 m) on trees with a mean height of 27 m and mean canopy cover of 32% (*n*=15). Canopy height and canopy cover at points where birds were observed differed significantly (Analysis of Variance (ANOVA), *df*=28, *F*=17.4, *P*<0.001 and *df*=28, *F*=12.9, *P*=0.001 respectively) from those of the random points.

Discussion

Our results confirm that Chapin's Flycatcher is a scarce resident in Kakamega Forest (Zimmerman *et al.* 1996). It is easily overlooked due to its inconspicuous plumage and behaviour, and this may have affected population density estimates. For instance, it can be reasonably assumed that most individuals that we observed as isolated individuals were, in fact, paired. It differs from African Dusky Flycatcher *Muscicapa adusta*, by being slightly larger with yellow gape corners, is less vocal and is a forest-interior species unlikely to occur in highly disturbed forest or near habitation (Zimmerman *et al.* 1996, Urban *et al.* 1997).

Local distribution

During the present study, Chapin's Flycatcher was found in the same forest fragments (Isecheno, Ikuywa and Buyangu) where previously recorded (Brooks *et al.* 1999), suggesting that its distribu-

Table 1. Estimated % area of suitable Chapin's Flycatcher *Muscicapa lendu* (CF) habitat and number of birds detected at the study sites.

Tableau 1. Estimation du pourcentage de la zone convenant au Gobemouche de Chapin *Muscicapa lendu* (CF) et nombre d'oiseaux détectés dans les sites étudiés.

Forest fragment	Size (ha)	% suitable habitat	Number of transects	Transects with CF	CF counted
Isecheno	310	70	37	9	10
Ikuywa	1,450	60	39	3	4
Buyangu	4,000	50	31	3	3
Yala	1,000	60	12	0	0
Kisere	457	80	6	0	0
Totals	7,217	60	125	15	17

tion within Kakamega has changed little. In Isecheno, one individual was seen in 1997 (Brooks *et al.* 1999), and ten during the present study. The presence and strict surveillance of forest guards has protected a near-pristine indigenous and presumably suitable habitat. In Ikuywa, a breeding record was reported by Stevenson (1991), an indication that suitable habitat formerly existed. However, over the years this forest has been heavily logged and currently the interior is open with only scattered trees. Nevertheless, we still found four flycatchers here. In Buyangu, one individual was sighted in December 1996 (Brooks *et al.* 1999) and we observed three. Numbers in this fragment may increase in future because of forest regeneration, facilitated by constant surveillance by Kenya Wildlife Service rangers (Mutangah *et al.* 1992, Oyugi 1996).

There are no historical records in the Yala and Kisere fragments and we did not find the species there. Although Yala has a high closed canopy and healthy tree population structure (Oyugi 1996), its 20-year isolation (1972–2002) has probably hindered recolonisation from the nearest forest patches (Ikuywa and Isecheno). However, Brooks *et al.* (1999) suggested that the flycatcher's montane affinities may properly explain the lack of records from this lower altitude fragment. The closed canopy of indigenous trees at Kisere (Oyugi 1998) may constitute suitable habitat for Chapin's Flycatcher and a local guide reported having seen one. We may have missed the species as surveys were conducted in this fragment on just one day for three hours and therefore future surveys should try to establish its presence or absence.

Five specimens taken in Kakamega Forest have been traced in two museums, the National Museums of Kenya, Nairobi (one collected in 1963), and the United States National Museum, Washington DC (four collected in 1965), but the fragments where they were taken are not specified (Brooks *et al.* 1999).

### Population status

BirdLife International (2000, 2004) estimated the global population of Chapin's Flycatcher at 2,500–10,000 individuals and declining. Table 1 presents estimates of the area of potentially suitable habitat for Chapin's Flycatcher (tall indige-

nous trees) in Kakamega Forest, based on our field observations and existing publications (Kokwaro 1988, Blackett 1994, Oyugi 1996, 1998, Bennun & Njoroge 1999, Brooks *et al.* 1999). Assuming that the species is restricted to such habitat, only 60% of the indigenous forest, i.e. 4,330 ha, would be suitable for it. Extrapolating our population density estimate to this area gives a very crude population estimate of *c.* 200 birds. Although this may be a significant underestimate (see comment above concerning the likelihood that most individuals that we recorded were paired), due to the species' unobtrusiveness, its population must still be small and threatened. The species' scarcity can be attributed to intense human activities, mainly logging, charcoal production, firewood collection, encroachment and overgrazing by cattle, which have continued to fragment the once-contiguous forest ecosystem. Fragmentation of Chapin's Flycatcher population in distant forest patches makes the species prone to local extinctions due to its greater vulnerability to demographic and environmental variation, and loss of genetic variability (Gaston 1994, Newmark 1999, Rodrigues & Gaston 2002). Chapin's Flycatcher may therefore be unable to persist long term in these forest fragments, and may eventually be extirpated unless conservation action to prevent further destruction of its habitat is taken.

### Recommendations

Our findings indicate that Chapin's Flycatcher is rare and its population small and probably declining. To ensure maintenance of a viable population we recommend the following:

Improvement of forest management practises to reduce the loss of indigenous vegetation.

Connecting all existing fragments of Kakamega Forest via corridors of planted indigenous tree species, to enhance avian dispersal between forest patches and reduce the possibility of local extinctions.

Conducting additional ecological studies of breeding and population dynamics, territory size and territoriality, and dispersal.

Development of continuous monitoring of the species in the region, by members of the Site Support Groups (SSG; linked to the IBA conservation programme of Nature Kenya).

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